

UNCLASSIFIED
EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

(U) COST: (Dollars in Thousands)

<u>Project Number & Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E0463 - (E-2C Improvements)	10,125	12,379	6,444	6,335	6,499	6,580	6,773	continued	continued
E2321 – (E-2 Radar Modernization)	35,051	23,951	12,254	13,586	5,820	0	0	0	112,189
TOTAL	45,176	36,330	18,698	19,921	12,319	6,580	6,773	continued	continued
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	14

(U)A. **MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: E-2C Improvements** provides pre-planned product improvements for the evolution of E-2C airborne weapon system capabilities in support of naval warfare command and control requirements. It has previously funded developments for the modification/replacement of selected weapon replaceable assemblies of current installed subsystems. This has resulted in a new baseline capability configuration referred to as Group II aircraft. The program has developed a Mission Computer Upgrade (MCU), applying on-going developments in data processing and target detection, which will relieve current bottlenecks in signal and data processing. The MCU will permit incorporation of additional functional capabilities to satisfy evolving operational requirements, e.g., Cooperative Engagement Capability (CEC), Satellite Communications (SATCOM), and permits the evolutionary growth of a Cruise Missile Defense (CMD) capability.

FY00-05: Funding provides for technology insertion of new emergent systems and subsystems. This initiative allows for data collection and the evaluation of new technologies in the context of emerging missions and requirements including Cruise Missile Defense, Ballistic Missile Defense, littoral warfare, combat identification, and Single Integrated Air Picture as well as parts and systems obsolescence. Emphasis will be upon the following areas: participation in exercises to assess capabilities against emerging threats; identify deficiencies; identification of candidate solutions; and ground/airborne demonstrations of the identified technologies.

The Radar Modernization Program (RMP) is a ground and flight prototype test demonstration and risk mitigation of multiple technologies. It initiates the application of new radar technologies to modernize the primary sensor of the E-2C weapon system to provide a definitive littoral surveillance capability integral to the Navy's Theater Air Missile Defense (TAMD) Integrated Warfare Architecture. Key technologies to be integrated are space-time adaptive processing (STAP), electronically scanning array (ESA), solid state transmitter, and high dynamic range digital receivers. The resulting detection system will provide a substantially improved overland performance, enhancing all current required mission areas while simultaneously contributing to the emerging TAMD mission requirements. The impact of the dominant battlefield awareness provided by this improved airborne early warning system will substantially contribute to the development of a single integrated air picture. These technologies and resultant equipment demonstrated in ground environment in FY1999, will be flight tested in FY2001 through FY2003 leading to an engineering change proposal (ECP) for introduction into fleet aircraft.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E0463

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: E-2C Improvements

(U) COST: (Dollars in Thousands)

<u>Project Number & Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E0463 - (E-2C Improvements)	10,125	12,379	6,444	6,335	6,499	6,580	6,773	continued	continued
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	14

(U) A. **MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:** E-2C Improvements provides pre-planned product improvements for the evolution of E-2C airborne weapon system capabilities in support of naval warfare command and control requirements. It has previously funded developments for the modification/replacement of selected weapon replaceable assemblies of current installed subsystems. This has resulted in a new baseline capability configuration referred to as Group II aircraft. The program has developed a Mission Computer Upgrade (MCU), applying on-going developments in data processing and target detection, which will relieve current bottlenecks in signal and data processing. The MCU will permit incorporation of additional functional capabilities to satisfy evolving operational requirements, e.g., Cooperative Engagement Capability (CEC), Satellite Communications (SATCOM), and permits the evolutionary growth of a Cruise Missile Defense (CMD) capability.

FY00-05: Funding provides for technology insertion of new emergent systems and subsystems. This initiative allows for data collection and the evaluation of new technologies in the context of emerging missions and requirements including Cruise Missile Defense, Ballistic Missile Defense, littoral warfare, combat identification, and Single Integrated Air Picture as well as parts and systems obsolescence. Emphasis will be upon the following areas: participation in exercises to assess capabilities against emerging threats; identify deficiencies; identification of candidate solutions; and ground/airborne demonstrations of the identified technologies.

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PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E0463

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: E-2C IMPROVEMENTS

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$3,551) - Conducted Spectrum Testing.
- (U) (\$6,574) – Continued software development and system integration.

2. FY 2000 PLAN:

- (U) (\$3,979) – Collect sensor data. Down select technologies for demonstration. Perform demonstration of selected systems.
- (U) (\$3,000) – Initiate Advanced Support Aircraft (ASA) Post Multi Year Procurement (MYP) Study.
- (U) (\$5,400) – Integrate UHF Electronically Scanned Antenna (UESA).

3. FY 2001 PLAN:

- (U) (\$6,444) – Collect sensor data. Down select technologies for demonstration. Perform ground and flight demonstration of selected systems.

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DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E0463

PROGRAM ELEMENT TITLE: E-2 SQUADRON

PROJECT TITLE: E-2C IMPROVEMENTS

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	9,783	4,048	6,544
(U) Appropriated Value:	10,439	12,448	
(U) Adjustments from Pres Budget:	342	8,331	-100
(U) FY2001 President's Budget Submit:	10,125	12,379	6,444

CHANGE SUMMARY EXPLANATION:

(U) Funding –

The FY1999 increase is due to minor pricing and inflation adjustments.

The FY2000 increase is due to increases for a follow-on Advanced Support Aircraft (ASA) study and UHF Electronically Scanable Antenna (UESA) development, and a decrease for an Across-the-Board Congressional Rescission.

The FY2001 decrease is due to minor pricing and inflation adjustments.

(U) Schedule – Not Applicable.

(U) Technical – Not Applicable.

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PROJECT NUMBER: E0463

PROGRAM ELEMENT TITLE: E-2C SQUADRONS

PROJECT TITLE: E-2C IMPROVEMENTS

(U) C. OTHER PROGRAM FUNDING SUMMARY

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To
<u>Appn</u>	<u>Actual</u>	<u>Budget</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>
APN 1/E-2C (LI #9 & 10)	395,820	382,608	320,872	264,220	214,618	0	0	0
APN 5/E-2C (LI #33)	80,889	75,921	18,485	26,196	11,596	16,836	13,736	1,331,600
APN 6/E-2C (LI #46)	12,390	12,953	13,093	14,889	4,276	2,874	0	0

Related RDT&E

(U) 0603658N (Ship Self Defense, CEC)

(U) C. ACQUISITION STRATEGY: Work will be led in-house. Necessary contractor support will be acquired using already existing contracts.

(U) D. SCHEDULE PROFILE

	<u>FY1999</u>	<u>FY 2000</u>	<u>FY2001</u>	<u>To Complete</u>
(U) Program Milestones			3Q/01 MCU MSIII Infra Red Search & Track (IRST) Demo Lasar Radar (LADAR) Demo Multi Source/Multi Sensor Integration (MSI) Demo	
(U) Engineering Milestones				
(U) T&E Milestone		2Q/00 MCU DT/OT-IIC 3Q/00 MCU DT/IIDTECHEVAL 4Q/00 MCU OPEVAL	Ground Demo	
(U) Contract Milestones			4Q/01 MCU FRP	

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E0463

PROJECT TITLE: E-2C IMPROVEMENTS

<u>Cost Categories:</u>	<u>Contract Method & Type</u>	<u>Performing Activity & Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
<u>PRODUCT DEVELOPMENT</u>												
Hardware/Software Develop. – MCU	SS/CPIF	GAC, NY/FL	149,801	5,682	12/98	0		0		0	155,483	155,483
Hardware/Software Develop. - CEC/MCU	SS/CPFF	GAC, NY/FL	12,194	0		0		0		0	12,194	12,194
Hardware/Software Develop. – MCU	SS/CPFF	GAC, NY/FL	13,998	0		0		0		0	13,998	13,998
Hardware/Software Develop. Misc.- MCU	SS/CPFF	GAC, NY/FL	1,021	0		0		0		0	1,021	1,021
Hardware/Software Dev.-Prior Yr. Efforts		GAC, NY/FL	<u>254,800</u>	<u>0</u>		<u>0</u>		<u>0</u>		<u>0</u>	<u>254,800</u>	<u>254,800</u>
Subtotal Product Development			431,814	5,682		0		0		0	437,496	437,496
<u>SUPPORT</u>												
Government Eng Support - MCU	WX/RC	NAWCAD PAX, MD	9,103	50	10/98	300	2/00	0		0	9,453	
Gov't Eng Support – Prior Yr. Efforts	WX/RC	NAWCAD PAX, MD	58,800	0		0		0		0	58,800	
Government Eng Support (AIR 4.2)-MCU	WX	NAWCAD PAX, MD	247	150	10/98	0		0		0	397	
Government Eng Support – ASA	WX/RX	NAWCAD PAX, MD	0	0		2,700	5/00	0		0	2,700	
Government Eng Support – UESA	WX	NAWCAD PAX, MD	0	0		4,000	5/00	0		0	4,000	
Subtotal Support			68,150	200		7,000		0		0	75,350	

GAC = GRUMMAN AEROSPACE CORPORATION

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E0463

PROJECT TITLE: E-2C IMPROVEMENTS

<u>Cost Categories:</u>	<u>Contract Method & Type</u>	<u>Performing Activity & Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
<u>TEST & EVALUATION</u>												
Test & Evaluation – MCU	WX/RC	NAWCAD PAX	34,655	3,923	10/98	0		0		0	38,578	
Test & Evaluation – UESA	WX/RX	NAWCAD PAX	0	0		1,100	2/00	0		0	1,100	
Test & Evaluation - (Prior Yr. Effort)	WX	NAWCAD PAX	39,200	0		0		0		0	39,200	
ACIS (PMS-440)	PD	NAVSEA	2,235	0		0		0		0	2,235	
LEAR JET – MCU	PD	PMA-207	307	294	5/99	0		0		0	601	
Test & Evaluation – MCU	WX	PMRF, HAWAII	1,500	0		0		0		0	1,500	
Miscellaneous – MCU	MIPR	VARIOUS	666	0		0		0		0	666	
Test & Evaluation - IMPROV	WX	NAWCAD PAX	0	0		3,964	10/99	4,449	10/00	Continued	Continued	
Test & Eval. – CONTRACT /IMPROV	PD	TBD	0	0		300	5/00	1,979	10/00	0	2,279	
Subtotal Test & Evaluation			78,563	4,217		5,364		6,428		Continued	Continued	
<u>MANAGEMENT</u>												
Management	WX/RX	NAWCAD PAX, MD	91	0	10/98	0		0		0	91	
TRAVEL	WX	NAWCAD PAX, MD	74	26	10/98	15	10/99	16	10/00	80	211	
Subtotal Management			165	26		15		16		80	302	
GRAND TOTAL			578,692	10,125		12,379		6,444		Continued	Continued	

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E2321

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

(U) COST: (Dollars in Thousands)

<u>Project Number & Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E2321 E-2 RADAR MODERNIZATION PROGRAM	35,051	23,951	12,254	13,586	5,820	0	0	0	112,189

Quantity of RDT&E Articles: Not applicable.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Radar Modernization Program (RMP) is a ground and flight prototype test demonstration and risk mitigation of multiple technologies. It initiates the application of new radar technologies to modernize the primary sensor of the E-2C weapon system to provide a definitive littoral surveillance capability integral to the Navy's Theater Air Missile Defense (TAMD) Integrated Warfare Architecture. Key technologies to be integrated are space-time adaptive processing (STAP), electronically scanning array (ESA), solid state transmitter, and high dynamic range digital receivers. The resulting detection system will provide a substantially improved overland performance, enhancing all current required mission areas while simultaneously contributing to the emerging TAMD mission requirements. The impact of the dominant battlefield awareness provided by this improved airborne early warning system will substantially contribute to the development of a single integrated air picture. These technologies and resultant equipment demonstrated in ground environment in FY1999, will be flight tested in FY2001 through FY2003 leading to an engineering change proposal (ECP) for introduction into fleet aircraft.

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PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E2321

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$3,112) – Completed risk reduction, testing and data analysis of form factor modules.
- (U) (\$4,406) - Completed integration and checkout (IACO) of flight instrumentation package.
- (U) (\$7,378) - Conducted ground testing at Pacific Missile Range Facility (PMRF).
- (U) (\$5,260) - Designed aircraft installation provisions for transition of flight hardware from ground tests to flight test vehicle.
- (U) (\$4,173) - Conducted final design review.
- (U) (\$10,722) - Initiated modification and fabrication of hardware for installation in flight vehicle C-130.

2. FY 2000 PLAN:

- (U) (\$4,906) - Complete modification and fabrication of hardware and installation provisions in C-130.
- (U) (\$7,045) - Start the IACO of full flight test system in C-130.
- (U) (\$12,000) - Accelerate RMP/MCU Upgrade Development.

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PROJECT TITLE: RADAR MODERNIZATION PROGRAM

3. FY 2001 PLAN:

- (U) (\$3,063) - Complete the IACO of C-130 Test Bed.
- (U) (\$1,224) – Install Flight Test Instrumentation.
- (U) (\$1,836) – Conduct Subsystem Flight Test.
- (U) (\$612) – Perform Elemental Data Analysis/Generate Quicklook Report.
- (U) (\$3,078) – Complete Preliminary Design of C-130 Processing Suite.
- (U) (\$2,441) - Initiate Parts/Fabrication of C-130 Processing Suite.

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PROJECT TITLE: RADAR MODERNIZATION PROGRAM

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	36,839	12,084	6,397
(U) Appropriated Value:	37,358	24,084	
(U) Adjustments from Pres Budget:	-1,788	+11,867	+5,857
(U) FY 2001 President's Budget Submit:	35,051	23,951	12,254

CHANGE SUMMARY EXPLANATION:

(U) Funding:

The FY1999 decrease is due to minor pricing and inflation adjustments.

The FY2000 increase is due to RMP/MCU Upgrade Development.

The FY2001 increase is due to an increase for RMP restructure and decreases for minor pricing and inflation adjustments.

(U) Schedule: Program plan adjustments for FY1999 and FY2000 reflect a restructured integrated schedule.

(U) Technical: Not applicable.

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PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not applicable

(U) Related RDT&E

(U) PE 0603238N (Global Surveillance Precision Strike and Advanced Technology) will fund the R&D effort to integrate existing RMP technologies at the PMRF for inclusion in TAMD. There are no requirements from this program element in FY00, but there may be additional requirements in FY01.

(U) C. ACQUISITION STRATEGY: Not applicable. Non-acquisition ground and flight prototype test demonstration and risk mitigation of multiple technologies.

(U) D. SCHEDULE PROFILE: Not applicable. Non-acquisition ground and flight prototype test demonstration and risk mitigation of multiple technologies.

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E2321

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

<u>Cost Categories:</u>	<u>Contract Method</u>	<u>Performing Activity &</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
PRODUCT DEVELOPMENT	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Complete	Cost	Contract
Hardware/Software Develop.	SS/CPFF	CLASSIFIED	19,462	26,937	10/98	8,595	10/99	1,404	10/00	12,478	68,876	68,876
Hardware/Software Develop.	SS/CPFF	GAC, NY	0	5,278	11/98	11,089	10/99	6,678	10/00	0	23,045	23,045
Hardware/Software Develop.	MIPR	HANSCOMB AFB, MA	748	0		0		0		0	748	748
Hardware/Software Develop.	SS/CPFF	KIRKLAND AFB, TX	476	0		0		0		0	476	476
Subtotal Product Development			20,686	32,215		19,684		8,082		12,478	93,145	
SUPPORT												
Government Engineering Support	WR/WX	NAWCAD PAX, MD	332	601	10/98	2,417	10/99	319	10/00	2,016	5,685	
Government Engineering Support	CPFF	CLASSIFIED		150	10/98	165	10/99	165	10/00	180	660	660
Subtotal Support			332	751		2,582		484		2,196	6,345	
TEST & EVALUATION												
Test & Evaluation	WX/WR	NAWCAD PAX, MD	0	1,700	10/98	1,300	10/99	3,303	10/00	4,521	10,824	
Test & Evaluation	CPFF	CLASSIFIED	265	300	10/98	330	10/99	330	10/00	360	1,585	1,585
Subtotal Test & Evaluation			265	2,000		1,630		3,633		4,881	12,409	
MANAGEMENT												
Management	CPFF	CLASSIFIED	0	50	10/98	55	10/99	55	10/00	60	220	220
Travel	WX	NAWCAD PAX, MD	35	35	10/98	0		0		0	70	
Subtotal Management			35	85		55		55		60	290	
Total Cost			21,318	35,051		23,951		12,254		19,615	112,189	

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